

Nov. 2, 1937.

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2,097,572

NOZZLE FOR SHOE CHANNEL CEMENTING MACHINES

Filed Sept. 28, 1935

2 Sheets-Sheet 1

Fig. 1.

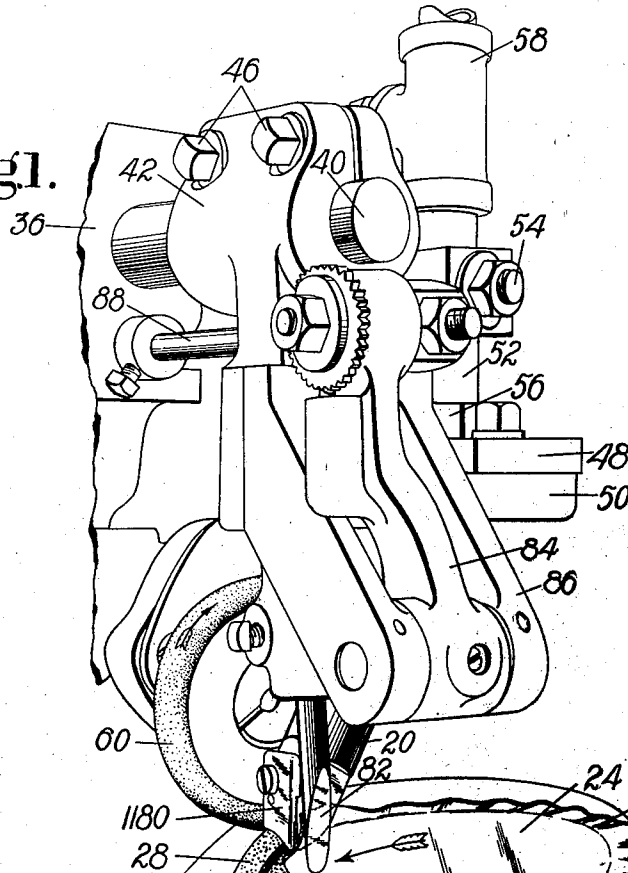


Fig. 2.

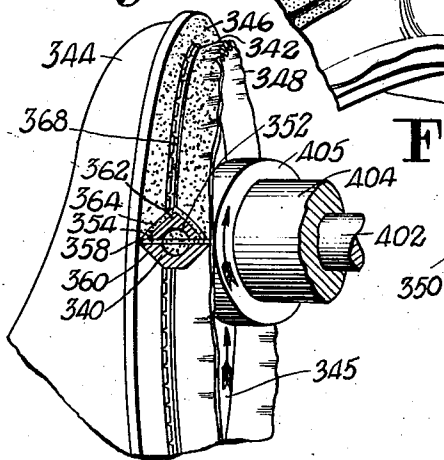
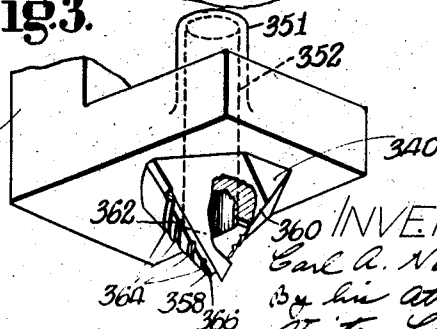


Fig. 3.



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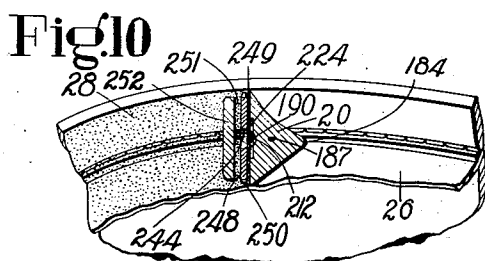
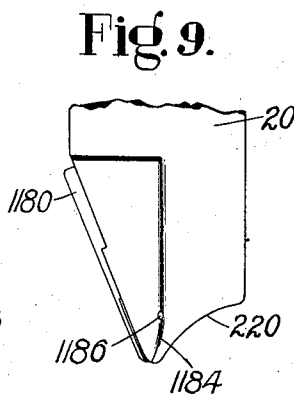
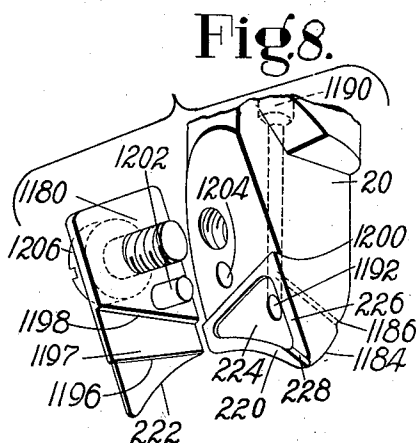
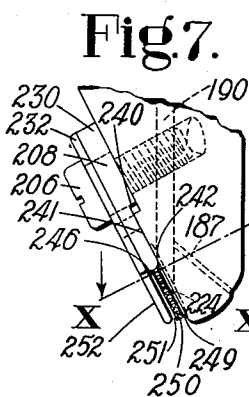
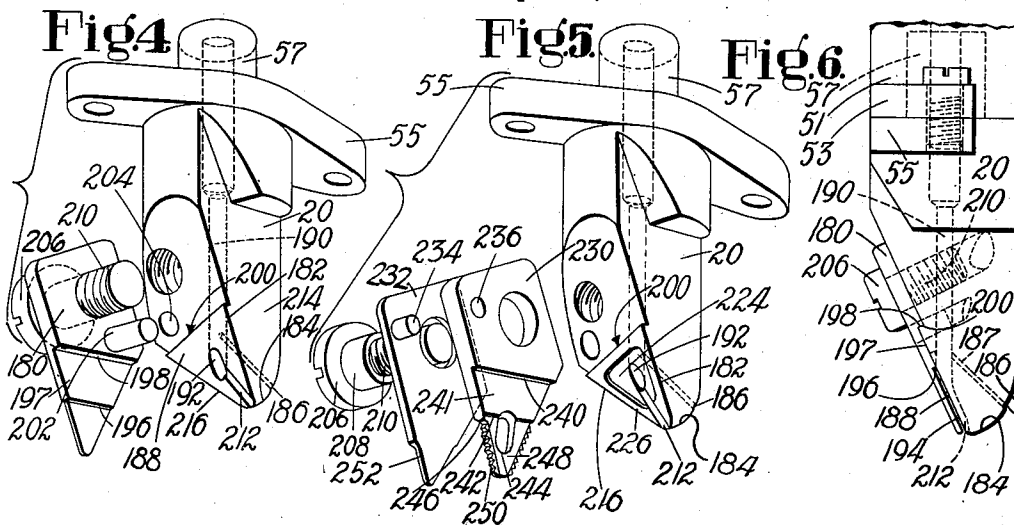
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NOZZLE FOR SHOE CHANNEL CEMENTING MACHINES

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2 Sheets-Sheet 2



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NOZZLE FOR SHOE CHANNEL CEMENTING MACHINES

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Application September 28, 1935, Serial No. 42,659
In Great Britain September 25, 1935

11 Claims. (Cl. 91-43)

This invention relates to nozzles for shoe cementing machines and is herein illustrated as embodied in a machine for applying cement to the channels of shoe soles after the seam has been formed, thereby to hold down the flap.

The application of cement to channels has heretofore been carried out principally by the use of a driven applying brush and while such machines have been made to serve their purpose when employed for applying cement of the naptha-cut rubber type, it has been necessary to apply an excessive quantity of cement because of the nature of the work. Cementing the channel takes place after the sole has been sewed to the shoe and, consequently, the channel bed at the shank of the shoe lies in a radically different plane from the channel bed at the forepart of the shoe, the contour of the channel at the ball line and at the toe being also abruptly curved. Furthermore, it is well understood that the channel flap, after it has been turned back to facilitate the sewing of the sole, is wrinkled and may stand upright from the sole or lie forward toward the channel base or even be tilted back away from the channel base. Frequently, the channel flap has dried and become stiff and hard at the time when the shoe is ready to be cemented. If this is the case, it presents a very uneven surface which must, nevertheless, be fairly uniformly coated with cement if the flap is to be made to stick to the sole. When the cement employed is of the naptha-cut rubber type or of the latex type, the danger of seriously damaging the shoe in case the upper is accidentally soiled is not very serious because these cements can be removed successfully with suitable cleaners from most types of leather. If, however, it is desired to use cements of the pyroxylin type or of the polymerized chloroprene type, one of which is known commercially as DuPrene, then the danger of soiling the shoe becomes a very real handicap because these cements cannot be removed readily, if at all.

Accordingly, an important object of the invention is to provide an improved nozzle for a channel cementing machine by means of which a cement may be applied to the channel uniformly and in just the desired quantity, without soiling other parts of the shoe.

With this object in mind, an important feature of the invention lies in the construction of the improved nozzle through which the cement may be extruded directly upon the base of the channel or upon the channel flap or both. Such a nozzle, as illustrated, is tapered axially to facili-

tate its insertion into the channel and is provided with lateral passages extending from the tapered end along opposite diverging sides of the nozzle, these passages being preferably of substantially uniform width throughout their whole extent to render it possible to apply the cement uniformly upon both sides of the channel and in exactly the desired quantities. In the illustrated construction, the work-contacting portion of the nozzle is tapered in the direction of relative movement between the work and the nozzle to facilitate the feeding movement as successive portions of the channel are treated. In one illustrated nozzle construction, both the leading and the trailing ends of the nozzle are tapered but this arrangement, while convenient, is not essential. Also as illustrated, the trailing end is provided with grooves extending in the general direction of relative movement thereby to facilitate the spreading of the cement.

Other features of the invention relating to the structure of the machine itself are not claimed herein since they form the subject matter of a divisional application Serial No. 112,723, filed November 25, 1936.

These and other features of the invention will be described in the following specification, taken in connection with the accompanying drawings, in which

Fig. 1 is an angular view of the nozzle and associated operating tools, showing the presentation of a piece of work to the machine;

Fig. 2 is an angular view looking at the channel of the forepart of a shoe, showing, in section, another embodiment of the invention, with the nozzle in operative position, together with a fragment of a feed roll;

Fig. 3 is an angular view on a still larger scale of this form of cement-applying nozzle;

Fig. 4 is an angular view on a large scale of another form of nozzle, with a cover plate removed;

Fig. 5 is a similar view of a modified construction in which two plates are employed;

Fig. 6 is a side elevation of the nozzle shown in Fig. 4 with the cover plate in position;

Fig. 7 is a side elevation of the nozzle shown in Fig. 5 with the plates in position;

Fig. 8 shows a modified form of the nozzle of Fig. 4;

Fig. 9 is a rear elevation of the nozzle shown in Fig. 8;

Fig. 10 is a plan view of a fragment of a shoe sole, showing the flap in lifted position, and illustrating the application of cement by means of

a nozzle such as that shown in Fig. 7, the end portion of which is shown in a section taken on the line X—X of Fig. 7.

In the embodiment illustrated in Figs. 1 and 4 to 10, inclusive, cement taken from a receptacle (not shown) is extruded under pressure through a nozzle 20 by which it is applied to the work. A piece of work, such as a shoe 22 mounted on a last, has an outsole attached by stitches positioned at the apex or bottom of a channel cut in the sole. In the cutting of this channel, there is formed a channel flap 26 which is to be cemented to the bed 28 of the channel in the position which it occupied before the channeling cut was made. The shoe is moved progressively past the nozzle 20 to cause the treatment of successive portions of the channel flap and the channel bed. Control of the quantity of cement extruded may be effected in any desired way.

In the machine, a nozzle carrier 42 is split at its upper end and held in the desired position on a rod 40 by pinch screws 46 (Fig. 1). A nozzle stem 51 (Fig. 6) has a flange 48 which is supported on spaced flanges 50 formed upon the carrier 42 and to which it is bolted. The connection between the receptacle and the nozzle stem 51 comprises a fitting 52 which contains a turn valve 54 and is provided with a base 56 secured in tight relation to the flange 48 of the nozzle stem 51 by screws (not shown). The upper end of the fitting is threaded in a T fitting 58 which is joined to the receptacle. From Figs. 4 and 6, it will be seen that the nozzle 20 itself has a flange 55 and a nipple 57. This nipple is received in a socket in the lower end of the stem 51 which has a flange 53 held to the flange 51 by screws.

Provision is made for feeding the work by means of a driven rubber-tired roll 60 resting on the side of the shoe 22, the flap 26 being pressed against the side of the nozzle 20 by means of an oscillated flap-pressing finger 82 clamped in the lower arm of a bell crank lever 84 (Fig. 1) which is pivotally supported by depending arms 86 secured to the nozzle carrier block 42. A vibratory motion is imparted to the finger 82 by means of a horizontal rod 88. Thus, the flap is pressed firmly against the nozzle but is intermittently released so that the work may be fed freely.

The nozzle 20 is positioned in the machine as shown in Fig. 1 in depending position and is inclined downwardly and forwardly with respect to the direction of movement of work presented thereto so that a removable plate 180 secured to the outlet face of the nozzle lies approximately in a vertical plane passing through the axis of the feed roll. The lower end of the nozzle is tapered heightwise at 182 (Fig. 5) to aid in pushing it into the channel and is formed with a comparatively sharp leading edge 184 (Fig. 10) in which there is an outlet 186 (Figs. 4, 5, and 6) to deliver cement at the bottom of the channel. This cement also lubricates the nozzle, as it were, making it easier to feed the work. The nozzle also has a substantially triangular face 188 through which, at 192, emerges a passage 190 extending down through the nozzle. The outlet 186 communicates with the passage 190 through a branch passage 187. It is through this passage 190 that cement is pumped at substantially constant pressure when the valve 54 is opened. As shown in Fig. 1, the shoe is moved away from the operator so that it approaches the leading edge 184 of the nozzle and so that the face 188 and the

cover or deflector plate 180 are upon the trailing face of the nozzle.

It is desired, then, to cause the cement to be applied uniformly upon both the channel flap 26 and the channel bed 28 as well as in the bottom of the channel. To this end, the cover plate 180 (Fig. 4), positioned directly to overlie the outlet opening 192 of the passage 190, acts as a deflector and cooperates with the face 188 to provide a transverse slot 194 (Fig. 6) forming lateral passages or slots extending from the apex of the tapered end of the nozzle heightwise thereof to a point determined by a shoulder 196 on the cover plate. A series of cover plates having this shoulder positioned at various distances from the pointed lower end may be utilized for channels $\frac{1}{4}$ -inch, $\frac{1}{8}$ -inch or $\frac{3}{8}$ -inch wide. Such nozzles, with their narrow outlet slots, show a notable flexibility in their ability to coact properly with channels, the depth of which varies between different parts of a shoe. Thus, even if the slot is longer than the channel is deep, the cement, due to its cohesiveness, will draw down from the upper end of the slot to the upper edge of the work being coated without being extruded over the edge of the channel flap or the channel base, as the case may be. Were a series of holes employed instead of a slot, the cement extruded from the exposed upper holes would be forced over the edge of the channel flap or the channel base. The cover plate is also provided with a shoulder 198 which is intended to rest upon a shoulder 200 (Figs. 4 and 6) formed upon the nozzle thereby to assist in locating the cover plate in exact relation to the triangular face 188 of the nozzle. The area 197 between the two shoulders fits closely against the end face 188. The outline of the triangular portion of the cover plate is slightly smaller than the corresponding outline of the face 188 to avoid any tendency of the edges of the cover plate to scrape off the cement just applied. Further to assist in locating the cover plate upon the nozzle, there may be provided a pin 202 which is received in a socket 204 in the nozzle. The cover plate will be held in position by a screw 206 having a threaded stem 210. The elliptical opening 192 formed where the passage 190 emerges in the face 188 is joined to the apex of the tool by means of a shallow groove 212 thereby insuring delivery of a sufficient quantity of cement to the bottom of the channel.

When the nozzle is in position in the machine, the channel flap 26 will be pressed against the plane surface 214 whereas the bed of the channel will be held against the opposite surface of the nozzle terminating in the edge 216. Under some conditions, the bed 28 of the channel will not be flat but will be curved away from the plane of the bottom of the sole toward the shoe upper. This will be found in women's close-edged shoes and may result in a different curvature of the channel bed around the forepart than that which is in the shank. In order to adapt the nozzle for best operation with a close-edged shoe, it is found desirable to change the nozzle construction to that shown in Figs. 8 and 9 where parts similar to those shown in Fig. 4 have been given similar numerals to which 1000 has been added. This nozzle differs from that shown in Fig. 4 in having an inner or back surface which is curved inwardly to form a valley terminating in the curved edge 220 which will be close to the shape of the channel bed around the forepart of the

shoe and will approximate that found in the shank of the shoe. With this construction, the cover plate 1180 is also provided with a pointed end having a curved edge 222. It will be noted that the shoulder 1196 in the cover plate provided for this style of nozzle is not exactly parallel to the shoulder 1198 but deviates from that relation in accordance with the need for providing outlet passages which will coact with the widths of the channel flap and the channel bed.

In constructing nozzles of the type shown in Fig. 4, it is common to do some hand filing where the groove 212 joins the elliptical outlet opening 192 and sometimes this is done carelessly, bringing the opening nearer to one side edge than the other. This renders unequal the frictional resistance offered to the cement flowing to the two sides and results in a somewhat uneven distribution of cement upon the two sides of the channel. It is avoided by forming a recess 224 (Figs. 5 and 8) in the end face of the nozzle which is separated from the edge of the nozzle by a ledge 226 of uniform width, thus insuring an even distribution of cement. In the form shown in Fig. 8, this recess is joined to the tip of the nozzle by a groove 228 corresponding to the groove 212 in Fig. 5.

When the nozzle is to be employed for cements of the polymerized chloroprene type, one form of which is marketed under the name Neoprene, then a nozzle construction such as that shown in Figs. 5 and 7 may be advantageously employed and has a pair of cover plates or deflectors 230 and 232. These deflectors, which are kept in alignment with one another by means of a stud 234 entering a socket 236, are mounted for slight lateral movement around a cylindrical portion 208 on the screw 206. To this end, the shoulder 240 on the inner plate 230 is spaced slightly from the shoulder 200 on the nozzle. The intermediate plate 230, having a surface 241 in close contact with the end surface of the nozzle, is also provided with a shoulder 242 corresponding to the shoulder 196 and, when positioned in tight relation to the end face 188, forms a transverse slot 249 terminating in lateral passages through which the cement is extruded upon the channel flap and the channel bed. This intermediate plate is also provided with an elongated opening 244 opposite the outlet end of the passage 190 (Fig. 10) so that a portion of the cement passes directly to the slot 251 (Figs. 7 and 10) between the lower portion of the intermediate plate 230 and the face of the outer plate 232. This slot is limited by a shoulder 246 upon the forward face of the plate 230. Thus, two slots are formed providing two lateral passages upon each face of the nozzle, these being separated by the thin lower end 248 of the intermediate plate 230. The edges of the lower end 248 are serrated at 250 thereby to provide a sort of spreading action for the cement which is delivered to the work from the slot 249. The generally triangular lower end 248 of the intermediate plate is slightly smaller than the corresponding portion of the nozzle, while the outline of the lower end 252 of the cover plate 232 is even smaller and is rounded on the outer edges. This, together with the opportunity for slight lateral displacement of the lower ends of the two cover plates with respect to the nozzle, reduces any interference between the nozzle and the shoe to a minimum as the nozzle treats sharply curved portions of the channel. The cement extruded through the first slot

249 is effective to wet the surface of the leather of the channel flap and channel bed while that extruded through the second slot 251 is enabled thereby to stick even more readily to these already coated surfaces, and to be applied in uniform and predetermined quantities.

Turning now to the embodiment illustrated in Figs. 2 and 3, a nozzle 340, the shape of which is shown most clearly in Fig. 3, is tapered axially, as in the nozzles previously described, to facilitate its insertion in the channel 342 of the sole of a shoe 344 thereby to apply cement to the base 346 of the channel and to the channel flap 348. The nozzle 340, mounted directly upon a carrier 350, has a neck 351 to which cement is supplied and is provided with a passage 352. This passage communicates directly with a transverse slot 354 extending from the apex of the V-shaped end of the nozzle up opposite sides of the V thereby to provide lateral slots or passages 356 and 358 (Fig. 2). The base of the channel is adapted to be positioned alongside the passage 358, whereupon the passage 356 will lie beside the channel flap. These passages are of a substantially uniform width throughout their whole extent so that the cement is applied in uniform quantities transversely of the nozzle and the channel and, hence, as the shoe is moved at a uniform rate by work-feeding mechanism to be later described, in uniform quantities along the whole length of the channel, on the nozzle and in a division thereof Serial No. 111,453, filed Nov. 13, 1936, on the machine. As will be seen from Figs. 2 and 3, the leading end 360 of the nozzle is tapered to facilitate movement of the shoe past the nozzle while the trailing end 362 is also tapered in order that there may be no clogging of the nozzle as it passes around the rather sharp curves at some portions of the shoe. It will be noted that the leading side 360 is slightly wider adjacent to the passages 356 and 358 than is the trailing side 362. This arrangement prevents the trailing side from having any tendency to scrape off the applied cement and, if desired, the trailing side 362 may be provided with horizontal grooves 364, still further to avoid displacement of the cement by the nozzle and acting as a sort of spreader.

Specific features of the machine embodiment illustrated in Figs. 1 and 4 to 10, inclusive, are not claimed herein since they are claimed in an application of Wilbur B. MacKenzie, Serial No. 43,064, filed October 1, 1935.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a shoe channel cementing machine, an extruding nozzle having an acutely tapered end portion and provided with elongated passages extending from the apex back along opposed sides of said end portion of the nozzle whereby cement may be extruded through one passage directly upon the base of the channel and through the other passage directly upon the channel flap.

2. In a shoe channel cementing machine, a pointed extruding nozzle adapted to be inserted in the channel of a shoe sole and between which and the shoe relative traversing movement is produced to cause the nozzle to coat successive points along the length of the channel, said nozzle having lateral outlet passages extending away from substantially the apex of the nozzle up the sides thereof and positioned adjacent to the sides of the channel, said nozzle also having a portion between said lateral passages which is tapered in the direc-

tion of movement of the point of contact between the work and the nozzle thereby to facilitate such relative movement.

3. In a shoe channel cementing machine, a V-shaped nozzle the sides of which diverge less than ninety degrees and having a transverse slot terminating laterally in outlet passages extending from the apex of the V up opposite sides of the V.

4. In a shoe channel cementing machine, an extruding nozzle acutely tapered axially of the nozzle to facilitate its insertion into the channel of a shoe sole, said nozzle being provided with lateral passages extending from the tapered end along opposite sides of the nozzle.

5. In a shoe channel cementing machine, a depending extruding nozzle acutely tapered heightwise thereof to facilitate its insertion into the channel of a shoe sole, said nozzle being provided with lateral slots extending heightwise of the sides of the tapered end and having a substantially uniform width throughout the slots.

6. In a channel cementing machine, a pointed nozzle provided with lateral passages with respect to the direction of movement of a shoe as it is moved past the nozzle through which cement may be extruded upon the channel base and the channel flap of the shoe, the leading side of said nozzle being tapered, thereby to facilitate relative traversing movement between the nozzle and the sole around curved portions of the channel.

7. In a channel cementing machine, a tapered nozzle having lateral passages with respect to the direction of movement of a shoe as it is moved past the nozzle through which cement may be extruded directly upon the channel base and the channel flap of the shoe, the trailing portion of said nozzle at the level of the passages being tapered.

8. In a channel cementing machine, a tapered nozzle having lateral passages with respect to the direction of movement of a shoe as it is moved past the nozzle through which cement may be extruded directly upon the channel base and the channel flap of the shoe, the trailing portion of said nozzle within the shoe channel being tapered and provided with grooves extending in the general direction of relative movement between the

nozzle and the work thereby to facilitate the spreading of the cement.

9. In a channel cementing machine, a nozzle tapered heightwise with respect to the channel to be cemented and provided with lateral passages extending from the point of the nozzle which is adapted to lie at the base of the channel to points on the sides which are positioned just within the margins of the channel base and the channel flap, said nozzle being tapered both forwardly and rearwardly with respect to the direction of relative traversing movement between the nozzle and the work, the width of the trailing portion of the nozzle adjacent to the passage being less than the width of the forward portion at the opposite side of the passage.

10. In a channel cementing machine, a tapered nozzle adapted to be inserted in the channel of a shoe and past which the shoe is moved to coat the linear extent of the channel, the side of said nozzle being arranged to be brought substantially into contact with the work, said nozzle being provided with a slot extending heightwise of the channel along the work-contacting side thereof whereby cement extruded through the slot will coat the whole width of the channel flap or the channel base as the case may be, that portion of the nozzle on the trailing side thereof which defines one side of the slot being inset laterally of the nozzle to avoid scraping from the work cement just applied.

11. In a shoe channel cementing machine, a nozzle the end portion of which is acutely tapered to facilitate its insertion in the channel of a shoe sole and past which the shoe is moved to coat the linear extent of the channel, the axis of said nozzle being upright with respect to the root of the channel as the sides of the channel rest against the sides of the nozzle, said nozzle being provided with delivery slots along the sides thereof of extending heightwise of the channel through which viscous cement may be extruded directly into contact with the work and whereby the whole width and length of the channel will be coated during the progressive movement of the shoe.

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CERTIFICATE OF CORRECTION.

Patent No. 2,097,572.

November 2, 1937.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 28, strike out the words "nozzle and the" and insert the same after "the" in line 49; lines 32, 33 and 34, strike out the comma and words ", on the nozzle and in a division thereof Serial No. 111,453, filed Nov. 18, 1936, on the machine" and insert the same after "1935" and before the period in line 53; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of February, A. D. 1938.

Henry Van Arsdale,
Acting Commissioner of Patents.